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# The role of discounting in socio-economic analysis and CO2 damage cost estimation

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This paper analyses how the theory on discounting and valuation of CO2 damage costs can be made operational and be implemented in the socioeconomic assessment of energy projects.

Three central problems in discounting are identified:

- Problem 1: Intergenerational and geographic inequality
- Problem 2: Non-substitutability of natural capital
- Problem 3: Uncertainty

Using a literature survey (Stern (2007), Azar (1999), Johansson-Stenman (2005), Sterner og Persson (2008), Cropper and Laibson (1999), Fisher and Narain, (2003), Dietz (2006) and others), the impact of these issues on the CO2 damage costs are quantified. We find that CO2 damage costs can be 5-8 times higher than the current market price for CO2-quotas; however, the damage is possibly still underestimated, since no study takes account of all three problems, but only takes account of one problem at a time.

Furthermore, the discount rate used for discounting when making cost benefit analyses of entire energy projects (the “outside” discount rate) is less significant than the discount rate used when defining the CO2 damage costs entering the cost-benefit analysis (the “inside” discount rate).

Research is still needed to combine the three central problems in one CO2 damage cost estimate.

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